REPORT

OF THE

COMMITTEE ON THE CENTRAL HIGH SCHOOL,

AND ALSO THE

REPORT

OF THE

EXAMINERS FOR THE VACANT PROFESSORSHIPS

OF THE

FRENCH LANGUAGE,

ANATOMY, PHYSIOLOGY

AND

NATURAL HISTORY,

AND

PRACTICAL ARITHMETIC.

PHILADELPHIA.
1862.

Office of the Controllers of Public Schools,

First School District of Pennsylvania.

Philadelphia, February 4th, 1862.

At a meeting of the Controllers of Public Schools, First District of Pennsylvania, held at the Controllers' Chamber, on Tuesday, February 4th, 1862, the following Report from the Committee on the Central High School was adopted:

ROBERT J. HEMPHILL, *Secretary.*

Philadelphia, February 4th, 1862.

To the Board of Controllers.

The Committee on the Central High School respectfully Report, that an examination of Candidates for the vacant Professorships in the Central High School was held at the School on Friday and Saturday, January 17th and 18th, 1862.

The report of the Examiners is appended.

The Committee respectfully present the names of F. A. Brégy, for the French Department; Joseph Wilson and George H. Stuart, for that of Practical Mathematics; Henry Hartshorne, M. D., and Prof. S. S. Haldeman, for that of Anatomy, Physiology, and Natural History.

T. G. HOLLINGSWORTH,
THOMAS WOOD,
THOS. W. MARCHMENT,
THOMAS FITZGERALD,
LEWIS BITTING,

Committee on High School.

Philadelphia, January 18th, 1862.

To the Committee on the High School
of the Board of Controllers.

GENTLEMEN:—The undersigned having been appointed by your Committee to hold an examination of Candidates for the Professorship of the French language in the Central High School, beg leave to report that an examination was held by them, pursuant to public notice, on Friday, the 17th January, 1862.

Messieurs Justin Clave, F. L. M. Jégo, F. M. J. Surault, Guillemet, F. A. Brégy, Amedée Vaillant, and De Lannoy, presented themselves as candidates.

The undersigned submitted each candidate to a thorough examination of his acquirements, both in the theory and the practice of his profession, and have much satisfaction in stating that they all exhibited much proficiency and high qualifications as teachers of the French language. Upon a deliberate consideration of all the requisites necessary for the peculiar position to be filled, however, the undersigned have unanimously determined to recommend to your Committee *Mr. Francis A. Brégy* as the most suitable person to fill the vacancy now existing in the Professorship of the French language at the High School.

Very respectfully, your obedient servants,

EDWARD KING,
RICHARD R. MONTGOMERY,
C. J. STILLE,
F. MAROTEAU,
V. SEMELADIS.

Philadelphia, January, 1862.

To THOS. G. HOLLINGSWORTH, ESQ.,
Chairman of the Committee on the Central High School.

SIR:—The undersigned, having been appointed to examine the Candidates for the Chair of Practical Mathematics in the Central High School of this city, and having discharged that duty, have the honor to submit their report.

The examination occupied the afternoon of January 17th, and the whole of January 18th, and was conducted in writing. The following list of questions was placed in the hands of each candidate, fifteen on the first day, and fifteen on the second.

I. Algebra.

1. Given $x + y + \sqrt{x + y} = 12\ x^3 + y^3 = 189$ to find x and y.
2. Define a geometrical progression and give the sum of 10 terms of the series, 1, 2, 4, 8, &c.
3. What are logarithms?
4. What are the base and modulus of the common logarithms?
5. Find the algebraic expression for the amount of a sum of money p, at compound interest for t years, at r per cent.

II. Geometry.

1. In every quadrilateral inscribed in a circle, the rectangle of the two diagonals is equivalent to the sum of the rectangles of the opposite sides taken two and two.
2. Find a square that shall be equivalent to a given pentagon.
3. If a circular segment is revolved about a diameter exterior to it, the volume generated is measured by $\frac{1}{6}\ \pi$ into the square of the chord into the distance between the perpendiculars let fall from the extremities of the arc on the chord.

III. Trigonometry.

1. Give some equivalent expressions for sin. x, cos. x, and tan. x.
2. In any triangle the sum of the two sides containing either angle, is to their difference as the tangent of half the sum of the two other angles is to the tangent of half their difference.
3. Prove that sin. p—sin. $q = 2$ cos. $\frac{1}{2}$ (p + q)—sin. $\frac{1}{2}$ (p—q.) [*Explanation*, p is the sum of two contiguous arcs of a circle, and q their difference.]
4. Prove that in any spherical triangle the sines of the sides are proportional to the sines of their opposite angles.

5. Define Napier's eireular parts; and give his two rules for the solution of right-angled spherieal triangles.
6. Having three sides of an oblique angled spherieal triangle, give the formulæ for finding one of the angles A, in terms of its sine and eosine.
7. Show the importanee of trigonometry to railroad engineering; to surveying and levelling; and to navigation.

IV. Analytical Geometry.

1. Prove that the square of the minor axis of an ellipse is to the square of the major axis, as the reetangles of the abscissas of the former are to the squares of their ordinates.
2. Find the equation of a tangent to the parabola.
3. A point and a straight line being given, in what eurve will be found the eentres of all the eireles passing through the given point and touehing the given line?

V. Surveying.

1. State the necessity of knowing the variation of the magnetie needle, and the manner of determining it?
2. Would it make any differenee in a survey, if part of the lines were run by the eompass at one time of the day, and another part at another hour, or on a different day?
3. Explain the method of finding the horizontal distanee between two inaeeessible objeets, only one of which ean be seen from a single station.

VI. Navigation.

1. In parallel sailing, prove that the cosine of the latitude of the parallel is to radius, as the distanee run is to the differenee of longitude.

VII. Astronomy.

1. Explain refraetion, parallax, and aberration.
2. Explain the retrograde motion of the moon's nodes and its eause.

3. Explain the equation of time.
4. Given the right ascension and declination of a star to find its longitude and latitude.
5. Given the heliocentric longitude and latitude of a planet to find its geocentric longitude and latitude.

VIII. Differential Calculus.

1. Find the differential of $a\,x^3\,y^2$.
2. The tangent of an angle whose radius is 1, being expressed by $\frac{\sin z}{\cos z}$, find its differential.
3. Divide the known number a into two parts, such that the product of the m power of the one into the n power of the other, shall be the greatest possible.

Summary of examination in Mathematics, Central High School, Jan. 17th and 18th, 1862.

Candidates.	Accuracy.	Fulness.	Style.	Average on a basis of 10.
No. 1, - -	8.73	8.83	8.90	8.82
No. 2, - -	7.53	7.50	7.36	7.46
No. 3, - -	Withdrawn.			
No. 4, - -	9.13	9.06	9.33	9.17
No. 5, - -	7.60	7.10	7.83	7.51

While the exercises of all the candidates were creditable to them, and showed a very respectable acquaintance with the subjects of the examination, the exercises of candidates No. 1 and No. 4 were so distinguished by accuracy and skill as to

warrant the Committee in recommending them both, as far as depends on this examination, as eminently qualified to discharge the duties of the professorship for which they are applicants.

Five candidates presented themselves for examination, who are known to the undersigned as Nos. 1, 2, 3, 4, and 5, and the names corresponding to these numbers were sealed up in envelopes, and placed in your hands. Each candidate was requested to write his number at the top of every page of his written work. At the close of the first day, No. 3 withdrew from the contest, but the others continued their examination to its close.

The results of a careful review of the papers submitted by Nos. 1, 2, 4, and 5, are put in tabular form for your inspection, and appended to this report.

Respectfully submitted,

WM. H. ALLEN,
LEMUEL STEPHENS,
Examiners.

Examination in Mathematics continued Jan. 24th.

In addition to the writtten examination, a trial being required of the two highest candidates, which should test their abilities as instructors, candidates No. 1 and No. 4 presented themselves at the High School on Friday, the 24th inst.

Several subjects were furnished to them in Algebra and Geometry, from which they were requested to select one in each study, and explain them in turn before a class. The presence, during that exercise, of several members of the Committee on High School relieves, in a measure, the delicacy which the Examiner felt in being called on to determine the merits of two performances, both of which exhibited so high an order of professional skill. But considering that the class was to be supposed previously unacquainted with the subjects to be explained, some distinction is due in favor of candidate No. 1, for carefulness in the statement of the steps of his reasoning, and for that

energy and spirit in address which is so necessary on part of the teacher, in order to secure the attention and interest of his class.

The marks assigned to the exercises, and their averages, combined with the averages obtained at the written examination are given in the following table:

CANDIDATES.	EXAMINATION IN TEACHING.				Average in Teaching.	Average in Written Examination.	Total Average.
	FIRST EXERCISE.		SECOND EXERCISE.				
	Thoroughness.	Manner.	Thoroughness.	Manner.			
No. 1, - - -	10.	10.	10.	10.	10.	8.82	9.41
No. 4, - - -	8.	9.	10.	9.	9.	9.17	9.08

One of the Examiners having been unavoidably absent from the examination in teaching, his signature cannot be obtained to this part of the report.

Respectfully submitted,

LEMUEL STEPHENS.

To Thos. G. Hollingsworth, Esq.,

Chairman of Com. on Central High School,

Philadelphia.

January 31*st*, 1862.

To T. G. HOLLINGSWORTH, ESQ.,

Chairman of Committee on Central High School.

SIR:—We the undersigned, Examiners appointed by the Committee on the Central High School to test the qualifications of applicants for the Professorships of Physiology, Anatomy, Natural History, and Hygiene, beg leave to report the following as the result of our examination of the merits of the several candidates.

Our opinion as to the examination by written questions is expressed in the usual form in Table No. 1, appended.

In the oral examination, the candidate having been allowed to choose as his subject one of three, which were submitted to him a few minutes before the time of the lecture, was afterwards permitted to question the pupils present, so as to exhibit as fully as possible his method of instruction. The subjects chosen for lecture by the candidates are stated below, and our average estimate of the capacity for teaching shown by the applicants, is presented in the Table No. 2, appended.

On account of the superior proficiency of Doctor Hartshorne and Prof. Haldeman, we respectfully recommend that the choice of the Board should be limited to one of these two candidates.

PAUL B. GODDARD, M.D.,
JOSEPH LEIDY, M.D.,
FRANCIS G. SMITH, JR., M.D.,
J. H. B. M'CLELLAN, M.D.,
S. WEIR MITCHELL, M.D.,
R. C. BRIDGES, M.D.

Questions in Special Human Anatomy.

1. Give the anatomy and relations of the sphenoid bone.
2. Describe the pericardium and its mode of connexion with the diaphragm as well as its attachments to the base of the heart.
3. Enumerate the principal cartilages of the body and state what differences are found in them.
4. Describe the muscles of the abdomen and their mode of connexion at the linea alba.
5. Describe the internal maxillary artery and its branches.
6. Describe the fifth pair of nerves and its ramifications.
7. Enumerate the principal secreting glands and give the description and relations of one of them.
8. Describe the eye.

Questions on Physiology.

1. Describe the process of gastric digestion, and give the composition of the gastric juice.
2. Describe intestinal absorption, stating what substances are absorbed by the veins, and what by the lymphatics.
3. Describe the types of circulation in the mammal, bird, fish and reptile.
4. What constitutes respiration? Describe the process in aquatic and air-breathing animals.
5. Describe briefly the functions of the liver, kidney, and spleen.
6. State the ingredients of the blood, the origin and uses of the blood corpuscles, and those of the albumen and fibrin of that fluid.
7. What are the various agencies concerned in the production of heat in the animal economy?
8. What is the present theory of menstruation and ovulation?
9. What are the two forms of nerve substance? State the divisions and functions of the nervous system.

10. What is meant by the recurrent sensibility of the anterior nerve-roots of the spinal nerves, and how is it explained?

Questions on Natural History.

1. What are the five divisions of the Animal Kingdom?
2. What are the characteristics of the highest division?
3. How do the cetacea differ from fishes?
4. What are the peculiarities of the ruminantia?
5. Why are the acalephs so called? and what is the character of the organs from which they are so named?
6. What is the general arrangement of the nervous system in the four higher divisions of the Animal Kingdom?
7. What is the character of the organ of hearing in the gasteropods?
8. What is the difference of the respiratory apparatus of insects and crustacea?
9. How does the shell of the acephalous mollusks grow?
10. Describe the heart and course of the circulation in mollusks.
11. What are the characteristics of the Exogens and Endogens? Give examples of both.
12. What are Diatomes, and how are they reproduced?

Questions on Hygiene.

1. What is hygiene?
2. What is the use of drainage in towns, and what are the best disinfectants or deodorizing agents?
3. State in cubic feet the amount of breathing space required in dormitories, and the best methods of changing the air of crowded apartments?
4. What evils arise from over-crowding the population of cities, ships, and hospitals?
5. What are the objections to intra-mural interments?
6. What influence upon health is exerted by bathing?
7. State briefly the evil influences upon health of the following occupations: making of phosphorus, matches, needle-grinding, working in lead, looking-glass making.

Questions in Human Histology.

1. Describe the intimate structure of bone.
2. Describe the intimate structure of cartilage.
3. Describe the intimate structure of the areolar tissue.
4. Give the minute anatomy of the liver, with the relations of its component parts to each other.
5. Describe the mucous membrane of the small intestine.
6. Give the minute structure and relations of the retina.

TABLE No. 1.—*Exhibiting result of examinations by written questions.*

				Fulness.	Accur'y.	Style.	Average
EXAMINERS.	Paul B. Goddard and J. H. B. M'Clellan.	Anatomy.	No. 1....	9.	9.	9.	9.
			No. 2....	4.	8.	3.	5.
			No. 3....	10.	10.	10.	10.
		Histology.	No. 1....	9.	9.	9.	9.
			No. 2....	0.	0.	0.	0.
			No. 3....	10.	10.	10.	10.
EXAMINERS.	S. Weir Mitchell and F. G. Smith.	Physiology.	No. 1....	10.	9.7	10.	9.9
			No. 2....	6.	6.	8.	6.2
			No. 3....	3.	2.1	2.	2 3
		Hygiene.	No. 1....	10.	10.	10.	10.
			No. 2....	2.1	6.1	8.	5.4
			No. 3....	2.	1.1	2.	1.7
EXAMINERS.	Joseph Leidy and Rob't Bridges.	Nat. History.	No. 1....	9.	10.	9.	9 3
			No. 2...	8.	9.	8.	8 3
			No. 3....	6.	4.	6.	5.3

General Average.—No. 1.....9.4
No. 2.....4.9
No. 3.....5.8

TABLE No. 2.—*Exhibiting the average estimate of the capacity for teaching.*

	Average.
No. 1, - - - - -	10.
No. 2, - - - - -	8.1
No. 3, - - - - -	5.4

No. 1 Lectured upon Food.

No. 2 Lectured upon Orders in Mammalia; and

No. 3 Lectured upon Anatomy of the Heart.